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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,027	07/30/2003	Joel M. Dry	OPTOLUM-005	9520
7590 DONALD J. LENKSZUS PO BOX 3064 CAREFREE, AZ 85377-3064			EXAMINER HO, TU TU V	
			ART UNIT 2818	PAPER NUMBER
			MAIL DATE 06/26/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/631,027

Applicant(s)

DRY, JOEL M.

Examiner

Tu-Tu Ho

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12, 14-33, 35-54 and 56-63 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14-33, 35-54 and 56-63 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

1. Applicant's Amendment filed 05/01/2007 has been reviewed and placed of record in the file.

### *Claim Rejections - 35 USC § 103*

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. **Claims 1-12, 14-33, 35-54, and 56-63** are rejected under 35 U.S.C. §103(a) as being unpatentable over Arndt et al. U.S. Patent 6,848,819 (the '819 reference, cited in a previous office action) in view of Bohler al. U.S. Patent 6,799,864 (cited by Applicant).

Referring to **claims 1-12, 14-33, 35-54, and 56-63**, the '819 reference discloses in Fig. 2B, a cross-section view of a tube, and respective portions of the specification a light source as claimed including a flexible circuit (1) wrapping around a metal tube for mounting light emitting diodes (LEDs) but fails to disclose: (i) that the metal tube is an elongate metal tube, i.e., a metal tube having more length than width as defined by Applicant – see “Applicant Arguments/Remarks Made in an Amendment” and “Specification” filed 05/01/2007 – and as required by **claims 1-2, 22-23, and 43-44**; and (ii) apertures in said flexible circuit for receiving said LEDs as required in **claims 15, 36, and 57**, and consequently further fails to disclose that each of said LEDs is disposed in a corresponding one of said missing apertures so as to be affixed in thermally conductive contact with said tube as required in **claims 16, 21, 37, 42, 58, and 63**.

Specifically, in reference to **claims 1-12, 14-33, 35-54, and 56-63**, the '819 reference discloses a light source, which is a radiation emitting semiconductor device and which is also a radiation emitting solid state device, substantially as claimed including:

a thermally conductive member (“tubularly shaped, cylindrical, hollow cooling member 3”, Fig. 2B, col. 3, line 55, through col. 4, line 61, particularly col. 4, lines 1-23 and lines 41-61, said cooling member being fabricated of a metal such as copper or aluminum, col. 4, lines 5-8) for carrying a flexible printed circuit (flex PCB 1, col. 4, line 45, in re **claims 14, 20, 35, 41, 56, and 62**), which in turn carries a plurality of solid state light sources (LED 2, in re **claims 1-2**),

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which are radiation emitting semiconductor solid state devices (LED 2, in re **claims 22-23 and 43-44**), and which are situated on different planes that constitute the tubularly shape; and

electrical conductors, which are not shown in Fig. 2B, for supplying electrical power to said solid state light sources;

said thermally conductive member being configured to conduct heat away from said solid state light sources (LED 2) or said radiation emitting semiconductor devices (LED 2) or said radiation emitting solid state devices (LED 2) to fluid contained by said thermally conductive member (col. 4, lines 41-61);

wherein:

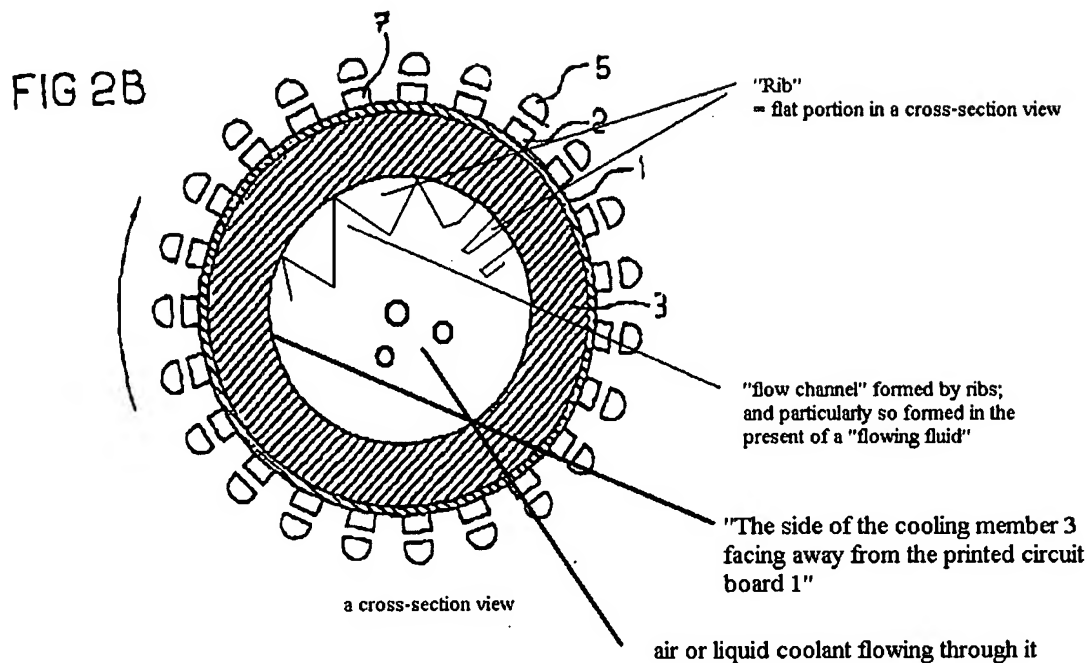
in re **claims 3, 24, and 45**, said fluid comprises air (col. 4, lines 60-62);

in re **claims 4, 9, 25, 30, 46, and 51**, said thermally conductive member (3) comprises an extrusion (“cooling ribs and/or a rough surface”, col. 2, lines 55-62,);

in re **claims 10, 31, and 52**, said extrusion is an aluminum extrusion (because said extrusion is formed from said thermally conductive member 3, which is formed of aluminum – col. 4, lines 5-9);

in re **claims 5, 11, 26, 32, 47, and 53**, said thermally conductive member (3) is a tubular member (“tubularly shaped”, col. 4, lines 45-50), in re **claims 6, 12, 27, 33, 48, and 54**, but would be obvious to be changed to a polygon cross-section as claimed because the shape differences are considered obvious and are not patentable unless unobvious or unexpected results are obtained from these changes;

in re **claims 8, 17-18, 29, 38-39, 50, and 59-60**, cooling ribs and/or suitable surface structure or roughening surface which is blackened (col. 4, lines 17+), when applied to the tubularly shaped cooling member 3 (col. 4, lines 45+) having “air or a liquid coolant flowing through it” (col. 4, lines 59-62), are interpreted as flow channels for a thermal transfer media disposed therein; and furthermore, said cooling ribs as interpreted are seen as “cross-section having flat portions” as recited in **claims 7, 28, and 49** in the cross-section view of Fig. 2B, reproduced - and as interpreted above – below or next page.



**However**, as noted above, the '819 reference fails to disclose: (i) that the metal tubular substrate is an elongate metal tube substrate as required by **claims 1-2, 22-23, and 43-44**; and (ii) apertures in said flexible circuit for receiving said LEDs as required in **claims 15, 36, and 57**, and consequently further fails to disclose that each of said LEDs is disposed in a corresponding one of said missing apertures so as to be affixed in thermally conductive contact with said tubular substrate as required in **claims 16, 21, 37, 42, 58, and 63**.

**Nevertheless**, for (ii), at the time the invention was made, Bohler, teaches forming apertures (122,124,126, Fig. 3) in a flexible circuit ("circuit board" 120, col. 4, lines 1-25) for receiving LEDs 100, 102, 104 such that each of said LEDs is disposed in a corresponding one of said apertures and such that each of said LEDs is affixed in thermally conductive contact with a metal substrate ("metallic slug" 110) for the purpose of incorporating high powered LEDs into a light source (col. 1, lines 35-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the reference's device such that its flexible circuit 1 comprises apertures (122,124,126 as taught by Bohler) for receiving high-powered LEDs 100, 102, 104, as taught by Bohler, and such that each of said high powered LEDs is disposed in a corresponding one of said modified apertures and such that each of said LEDs is affixed in thermally

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conductive contact with tubular metal substrate 3. One would have been motivated to make such a change for the purpose of utilizing at-the-time-the-invention-was-made available high-powered LEDs.

As for (i), since a change in size and shape is recognized as being within the level of ordinary skill in the art (MPEP 2144.04 [R-1], section IV), a modification to change the tubularly shaped cooling member 3, whose cross-section is shown in Fig. 2B, to have a length more than a width would have been obvious to one of ordinary skill in the art at the time the invention was made.

And finally, although the reference does not teach a clip for mounting the modified elongate thermally member as required by **claims 19, 40, and 61**, providing a clip for mounting said modified elongate thermally member is considered an intended use and therefore such providing would have been obvious to one of ordinary skill in the art at the time the invention was made.

### ***Conclusion***

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu-Tu Ho whose telephone number is (571) 272-1778. The examiner can normally be reached on 6:30 am - 3:00 pm, Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven H. Loke can be reached on (571) 272-1657. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

06-19-2007

/Tu-Tu V. Ho/

Primary Examiner, A.U. 2818